

April 19, 2021

Mr. Andrew Grenzer Chief, Solid Waste Operations Maryland Department of the Environment Land Management Administration 1800 Washington Boulevard, Ste 735 Baltimore, Maryland 21230-1719

Subject: Groundwater Discharge Permit Renewal Application

Groundwater Discharge Permit No. 2016-GWD-2090

Hunting Ridge Construction and Demolition Rubble Landfill

Hurlock, Maryland

Dear Mr. Grenzer:

On behalf of Waste Management of Maryland, Inc. (Waste Management), Tetra Tech, Inc. (Tetra Tech) is pleased to submit the enclosed Groundwater Discharge Permit Application for Unlined Rubble Landfills form for the renewal of the above referenced permit. The application includes the Worker's Compensation Insurance policy number and a copy of the most recent annual groundwater monitoring report (2020 Annual Groundwater Monitoring Report, dated January 2021). The application includes a recommendation of continued monitoring at the site in accordance with the sampling plan (Attachment D).

It should be noted that since this area has been completely capped, the closed landfill does not allow for continued surface water recharge. Accordingly, it is expected that the volume of leachate discharged to groundwater will continue to decline over the post-closure monitoring and maintenance period.

I trust you find this submittal satisfactory. If you have any questions regarding this application or require additional information, please contact me at 410-990-4607 or peter.rich@tetratech.com.

Sincerely,

Peter A. Rich, P.E. Principal Engineer

Enclosure

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Land Management Administration ● Solid Waste Program
1800 Washington Boulevard ● Suite 605 ● Baltimore Maryland 21230-1719
410-537-3315 ● 800-633-6101 x3315 ● www.mde.maryland.gov

Groundwater Discharge Permit Application For Unlined Rubble Landfills

Authority: Title 9, Enviro	onment Article, <u>Annota</u>	ated Code of Maryla	and, and Code of Mary	land Regulations (COMAR) 26.08.04
Application for:	☐ New Permit	X Renev	wal Permit	
Existing Permit No. 201 Applicant's Legal Name:			12 / 28 / 2016	Expiration Date: 12 / 27 / 2021
Applicant's Status:	☐ Individual	X Corporation	☐ Government	Other:
entity's information provi	ment of Assessments and s/entity must be registered ided in this application mu	Taxation (SDAT) II d to do business in Ma ust match the informat	No.: F03168788 ryland before a permit ca ion in the SDAT register.	n be issued. The business or Article. Please provide one of the following
(1) A copy of a Certificat	te of Compliance issued	l by the Maryland \	Vorkers' Compensatio	
Applicant's Mailing Add	ress: 10376 Bullock Dri	ive	City: King	George State: VA Zip Code: 22485
Applicant's Telephone N	o.: (479) <u>295</u> - <u>4</u>	1676	Facsimil	le No.: ()
Emergency Contact Nam	e & Title: <u>David Kaasa</u>	/ District Manager	Telepho	one No.: (479) <u>295</u> - <u>4676</u>
Facility/Site Name: Hunt	ing Ridge Construction a	and Demolition Debr	is Landfill	
Facility/Site Address: 680)1 East New Market - El	lwood Road	City: Hurlock	State: <u>MD</u> Zip Code: <u>21641</u>
County: Dorchester		Marylai	nd Grid Coordinates: _	110 / 305 -
County Zoning Map No.:	5	Lot/Par	cel No.: Map 5/Parcel 9	<u> 0 Deed/Liber/Folio No.: PLC/00267/00868</u>
State Legislative District:	: <u>37B</u>	Local C	ouncil/Election Distric	t: <u>4/15</u>
Bay Tributary Watershe	d Code: 02130403	Latitud	e/Longitude (Deg/Min	/Sec): <u>38</u> - <u>40</u> - <u>10</u> / <u>75</u> - <u>53</u> - <u>45</u>
Site Acreage: 44		Landfil	Acreage: 28	
Nature of Business (descriving with proper soil cover.	ribe briefly): <u>Closed ru</u>	bble landfill where in	ncoming waste was redu	nced to smallest practical volume and covered

Form Number: MDE/LMA/PER.002

18-Jun-14

TTY Users: 800-201-7165

List Other Environmental Permits Held For the Site: (e.g., NPDES	S-surface water; PSD-air emissions; RCRA-hazardous waste, etc).
Post-Closured period commenced 1/16/1998: Air Permit to Construct	: 09-9-0025N, issued 6/18/1998; State Water Appropriation Permit
No. DO91G038(03) Effective 5/1/1996; Stormwater NPDES General	Permit No. 97-SW, Issued 12/1/1997; Dorchester Soil CD Sediment and
Erosion Control Plan, Renewal 4/9/1997.	
Wastewater (Leachate) Description:	
Percolation through the disposal cells from leakage through the flexible	le membrane cap (see cross sections in Attachment A) and the decrease
in water content of the waste as it drains.	
Flow Calculations:	
Average: 256 gallons per day	
Maximum: 375 gallons per day	
(see HELP Model run in Attachment B)	
Groundwater Characteristics (Attach Latest Groundwater Sample Results)	
•	
Map Of The Facility	
This application must be accompanied by a copy of a U.S. 1" = 2000 feet, showing the exact location of the facility.	S. Geological Survey topographical map or road map with a scale of
By signing this form, I the applicant or duly authorized representation contents of this application are true to the best of my knowledge, in the Department to have access to the site of the facility for inspectitime. I acknowledge that depending on the type of facility applied	nformation, and belief. I hereby authorize the representatives of ion and to records relating to this application at any reasonable
David Kaasa	4.15.2021
Signature of Applicant	Date
David Kaasa	District Manager
Applicant's Name (Print)	Title

This Notice is provided pursuant to §10-624 of the State Government Article of the Maryland Code. The personal information requested on this form is intended to be used in processing your application. Failure to provide the information requested may result in your application not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment ("MDE") is a public agency and subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by Federal or State law.

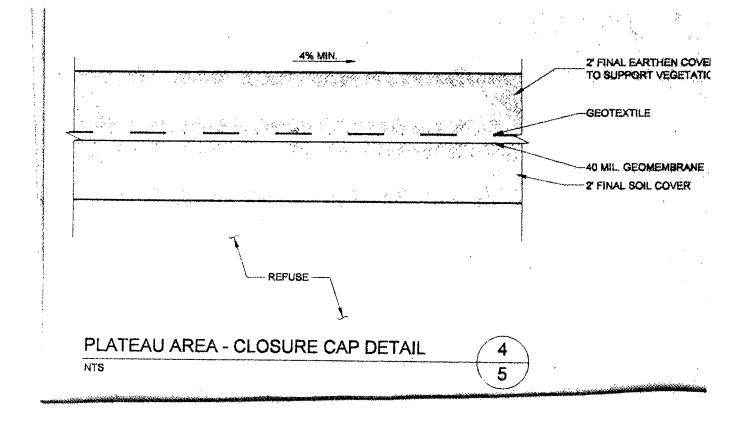
Privacy Act Notice: This Notice is provided pursuant to the Federal Privacy Act of 1974, 5 U.S.C. §552.a. Disclosure of your Social Security Number or Federal Employer Identification Number on this application is mandatory pursuant to the provisions of §1-203 (2003), Environment Article, <u>Annotated Code of Maryland</u>, which requires the MDE to verify that an applicant for a permit has paid all undisputed taxes and unemployment insurance. Social Security or Federal Employer Identification Numbers will not be used for any purposes other than those described in this Notice.

Form Number: MDE/LMA/PER.002

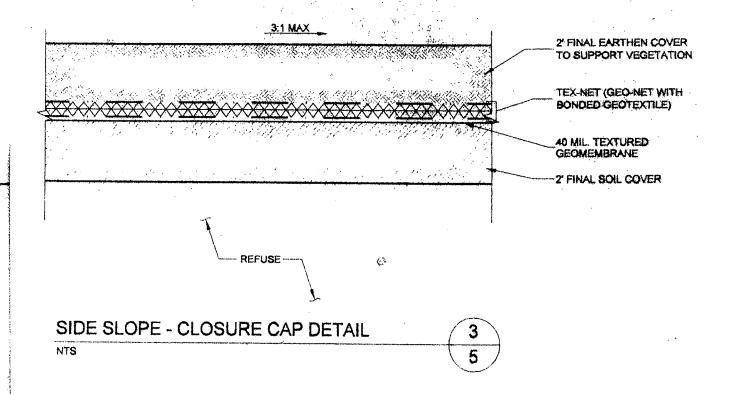
18-Jun-14

TTY Users: 1-800-735-2258

ATTACHMENT A CAP CROSS SECTIONS



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ATTACHMENT B FLOW CALCULATIONS HELP MODEL

PRECIPITATION DATA FILE: Y:\HELP3\DATA4.D4
TEMPERATURE DATA FILE: Y:\HELP3\DATA7.D7
SOLAR RADIATION DATA FILE: Y:\HELP3\DATA13.D13
EVAPOTRANSPIRATION DATA: Y:\HELP3\DATA11.D11
SOIL AND DESIGN DATA FILE: Y:\HELP3\DATA10R1.D10
OUTPUT DATA FILE: Y:\HELP3\DATA10r1.OUT

TIME: 15: 7 DATE: 7/23/1997

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER MATERIAL TEXTURE NUMBER 0

THICKNESS = 24.00 INCHES

POROSITY = 0.4300 VOL/VOL

FIELD CAPACITY = 0.3210 VOL/VOL

WILTING POINT = 0.2210 VOL/VOL

INITIAL SOIL WATER CONTENT = 0.4167 VOL/VOL

EFFECTIVE SAT. HYD. COND. = 0.259999997000E-04 CM/SEC

LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER MATERIAL TEXTURE NUMBER 0

THICKNESS	=	0.12 INCHES	
POROSITY	=	0.8500 VOL/VOL	
FIELD CAPACITY	**	0.0100 VOL/VOL	
WILTING POINT	×	0.0050 VOL/VOL	
INITIAL SOIL WATER CONTENT	=	0.8486 VOL/VOL	
EFFECTIVE SAT. HYD. COND.	=	0.340000004000	CM/SEC
SLOPE	==	4.00 PERCENT	
DRAINAGE LENGTH	=	200.0 FEET	

LAYER 3

TYPE 4 - FLEXIBLE MEMBRANE LINER MATERIAL TEXTURE NUMBER 36

THICKNESS	=	0.04 INCHES
POROSITY	=	0.0000 VOL/VOL
FIELD CAPACITY	=	0.0000 VOL/VOL
WILTING POINT	=	0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399999993000E-12 CM/SEC
FML PINHOLE DENSITY	=	2.00 HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00 HOLES/ACRE
EMT. DI.ACEMENT OHAT.TOV	=	2 - EXCELLENT

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER MATERIAL TEXTURE NUMBER 0

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4300 VOL/VOL
FIELD CAPACITY	=	0.3210 VOL/VOL
WILTING POINT	=	0.2210 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3204 VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.220000002000E-04 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER MATERIAL TEXTURE NUMBER 0

THICKNESS	=	840.00 INCHES	
POROSITY	=	0.4000 VOL/VOL	
FIELD CAPACITY	=	0.1700 VOL/VOL	
WILTING POINT	=	0.0800 VOL/VOL	
INITIAL SOIL WATER CONTEN	T =	0.1693 VOL/VOL	
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/S

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM A USER-SPECIFIED CURVE NUMBER OF 71.0, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 200. FEET.

SCS RUNOFF CURVE NUMBER	=	72.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	7.000	ACRES
EVAPORATIVE ZONE DEPTH	=	24.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	10.001	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	10.320	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	= .	5.304	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	160.029	INCHES
TOTAL INITIAL WATER	=	160.029	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM Baltimore Maryland

MAXIMUM LEAF ARE	A INDEX	=	3.00	
START OF GROWING	SEASON (JULIAN DATE)	=	152	
END OF GROWING S	EASON (JULIAN DATE)	=	295	
AVERAGE ANNUAL W	IND SPEED	=	9.30	MPH
AVERAGE 1ST QUAR	TER RELATIVE HUMIDITY	=	62.00	8
AVERAGE 2ND QUAR	TER RELATIVE HUMIDITY	=	65.00	8
AVERAGE 3RD QUARS	TER RELATIVE HUMIDITY	=	71.00	8
AVERAGE 4TH QUARS	TER RELATIVE HUMIDITY	=	68.00	8

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BALTIMORE MARYLAND

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
		~~~~~			
3.00	2.98	3.72	3.35	3.44	3.76
3.89	4.62	3.46	3.11	3.11	3.40

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BALTIMORE MARYLAND

#### NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

UAN/UUD	LDD/AUG	PERMY DESE	AFR, OCT	1261/100	OUM/ DEC
JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC

34.60 37.10 46.00 55.20 64.90 73.60 · 77.60 76.30 70.10 59.30 49.90 39.70

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BALTIMORE MARYLAND

STATION LATITUDE = 39.18 DEGREES

ANNUAL TOTALS FOR YEAR 1						
	INCHES	CU. FEET	PERCENT			
PRECIPITATION	41.53	1055277.250	100.00			
RUNOFF	7.287	185150.219	17.55			
EVAPOTRANSPIRATION	30.684	779691.750	73.89			
DRAINAGE COLLECTED FROM LAYER 2	3.5082	89143.898	8,45			
PERC./LEAKAGE THROUGH LAYER 3	0.053542	1360.512	0.13			
AVG. HEAD ON TOP OF LAYER 3	4.2944					
PERC./LEAKAGE THROUGH LAYER 5	0.576003	14636.226	1.39			
CHANGE IN WATER STORAGE	-0.525	-13344.748	-1.26			
SOIL WATER AT START OF YEAR	163.881	4164212.250				
SOIL WATER AT END OF YEAR	163.356	4150867.500				

0.000

0.0000

0.000

SNOW WATER AT START OF YEAR

SNOW WATER AT END OF YEAR

ANNUAL WATER BUDGET BALANCE

EVAPOTRANSPIRATION

0.000 0.00

0.00

0.00

0.000

-0.061

28.640 727736.250 69.89

ANNUAL TOTALS FOR YEAR 2

INCHES CU. FEET PERCENT

PRECIPITATION 40.98 1041301.690 100.00

RUNOFF 9.045 229830.937 22.07

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DRAINAGE COLLECTED FROM LAYER 2	5.0833	129166.523	12.40
PERC./LEAKAGE THROUGH LAYER 3	0.102482	2604.073	0.25
AVG. HEAD ON TOP OF LAYER 3	8.2607		•
PERC./LEAKAGE THROUGH LAYER 5	0.553936	14075.524	1.35
CHANGE IN WATER STORAGE	-2.342	-59507.387	-5.71
SOIL WATER AT START OF YEAR	163.356	4150867.500	
SOIL WATER AT END OF YEAR	161.014	4091360.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.180	0.00

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ANNUAL TOTALS	FOR YEAR 3		
	INCHES	CU. FEET	PERÇENT
PRECIPITATION	51.14	1299467.120	100.00
RUNOFF	14.104	358373.156	27.58
EVAPOTRANSPIRATION	31.778	807470.437	62.14
DRAINAGE COLLECTED FROM LAYER 2	4.7617	120995.344	9.31
PERC./LEAKAGE THROUGH LAYER 3	0.086156	2189.233	0.17
AVG. HEAD ON TOP OF LAYER 3	6.9621		
PERC./LEAKAGE THROUGH LAYER 5	0.532121	13521.190	1.04
CHANGE IN WATER STORAGE	-0.035	-893.016	~0.07
SOIL WATER AT START OF YEAR	161.014	4091360.000	
SOIL WATER AT END OF YEAR	160.628	4081560.250	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.351	8906.755	0.69
ANNUAL WATER BUDGET BALANCE	0.0000	-0.041	0:00
*********	******	*******	******

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ANNUAL TOTAL	s for year 4	;	
	INCHES	CU. FEET	PERCENT
PRECIPITATION	37.46	951858.562	100.00
RUNOFF	4.047	102827.656	10.80
EVAPOTRANSPIRATION	31.058	789173.937	82.91
DRAINAGE COLLECTED FROM LAYER 2	3.5382	89906.000	9.45
PERC./LEAKAGE THROUGH LAYER 3	0.043325	1100.881	0.12
AVG. HEAD ON TOP OF LAYER 3	3.5752		
PERC./LEAKAGE THROUGH LAYER 5	0.513055	13036.726	1.37
CHANGE IN WATER STORAGE	-1.696	-43085.949	-4.53
SOIL WATER AT START OF YEAR	160.628	4081560.250	
SOIL WATER AT END OF YEAR	159.283	4047381.250	
SNOW WATER AT START OF YEAR	0.351	8906.755	0.94
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.195	0.00
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ANNUAL TOTALS	FOR YEAR 5		
	INCHES	CU. FEET	PERCENT
PRECIPITATION	46.49	1181311.250	100.00
RUNOFF	8.406	213587.562	18.08
EVAPOTRANSPIRATION	32.009	813342.062	68.85
DRAINAGE COLLECTED FROM LAYER 2	4.2029	106795.023	9.04
PERC./LEAKAGE THROUGH LAYER 3	0.061697	1567.715	0.13
AVG. HEAD ON TOP OF LAYER 3	4.9996		•
PERC./LEAKAGE THROUGH LAYER 5	0.491553	12490.358	1.06
CHANGE IN WATER STORAGE	1.381	35096.168	2,97

SOIL WATER AT START OF YEAR	159.283	4047381.250	
SOIL WATER AT END OF YEAR	160.664	4082477.250	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.048	0.00

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AVERAGE MONTH	LY VALUES IN	TNCHES	FOR YEARS	T THR	OUGH 5	
	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DE
PRECIPITATION	400 the size day and use wide				400 apr 600 hab 406 to 400	
TOTALS					3.75 2.31	
STD. DEVIATIONS	1.95 2.27	1.15 2.38			1.38 1.21	
RUNOFF						
TOTALS	0.574 1.041				0.508 0.002	
STD. DEVIATIONS	0.805 1.965				0.576 0. <b>004</b>	
EVAPOTRANSPIRATION						
TOTALS					2.638 1.367	
STD. DEVIATIONS	0.171 1.119		0.417 0.483	0.641 0.226	0.796 0.2 <b>4</b> 1	1.428
ATERAL DRAINAGE COL	LECTED FROM	LAYER 2				
TOTALS		0.5455 0.0197		0.6318 0.0329	0.5700 0.0069	
STD. DEVIATIONS	0.2739 0.3553	0.2151 0.0338		0.1462 0.0609	0.2915 0.0122	
PERCOLATION/LEAKAGE	THROUGH LAYE	R 3				
TOTALS		0.0125	0.0156 0.0000		0.0076 0.0000	

STD. DEVIATIONS	0.0079	0.0067 0.0000	0.0072 0.0000	0.0043 0.0000	0.0092 0.0000	0.0058 0.0096
PERCOLATION/LEAKAGE TH	ROUGH LAYER	3				
TOTALS	0.0463 0.0453	0.0414 0.0451	0.0458 0.0435	0.0443 0.0447	0.0455 0.0433	0.0440 0.0443
STD. DEVIATIONS	0.0027 0.0029	0.0025 0.0029	0.0032 0.0027	0.0029 0.0027	0.0029 0.0027	0.0027 0.0026

#### AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD	ACROSS LAYER	3				•
AVERAGES	11.6469 3.1657	13.0520	14.6062 0.0003	7.7564 0.0028	7.1774 0.0006	6.0987 3.9120
STD. DEVIATIONS	7.3859 3.1542	6.7575 0.0028	6.5102 0.0006	4.3486 0.0051	8.5967 0.0011	5.7693 8.7362

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AVERAGE ANNUAL TOTALS &	(STD. DEVIATIONS) FO	R YEARS 1 THROUG	H 5
	INCHES	CU. FEET	PERCENT
PRECIPITATION	43.52 ( 5.33	9) 1105843.2	100.00
RUNOFF	8.577 ( 3.639	4) 217953.92	19.709
EVAPOTRANSPIRATION	30.834 ( 1.337	6) 783482.94	70.849
LATERAL DRAINAGE COLLECTED FROM LAYER 2	4.21886 ( 0.708	96) 107201.359	9.69408
PERCOLATION/LEAKAGE THROUGH FROM LAYER 3	0.06944 ( 0.024	32) 1764.483	0.15956
AVERAGE HEAD ACROSS TOP OF LAYER 3	5.618 ( 1.943	)	
PERCOLATION/LEAKAGE THROUGH FROM LAYER 5	0.53333 ( 0.033	18) 13552.005	1.22549
CHANGE IN WATER STORAGE	-0.643 ( 1.4556	6) -16346.99	-1.478
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PEAK DAILY VALUES FOR YEARS	1 THROUGH	5
	(INCHES)	(CU. FT.)
PRECIPITATION	5.68	144328.797
RUNOFF	4.542	115418.7500
DRAINAGE COLLECTED FROM LAYER 2	0.04576	1162.78040
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.000864	21.95575
AVERAGE HEAD ACROSS LAYER 3	24.119	
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.001974	50.15368
SNOW WATER	1.95	49556.4609
	•	4300
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.	4300
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.	2137

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FINAL WATE	R STORAGE AT	END OF YEAR 5	
LAYER	(INCHES)	(VOL/VOL)	
1	9.1039	0.3793	
2	0.1061	0.8486	
3	0.0000	0.0000	
4	7.6337	0.3181	
5	139.9686	0.1666	
SNOW WATER	0.000		
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### ATTACHMENT C

2020 ANNUAL GROUNDWATER MONITORING REPORT (provided as a separate file)

# **ATTACHMENT D**GROUNDWATER SAMPLING PLAN

### **Hunting Ridge Groundwater Sampling Plan**

#### Frequency

- MW-1 and MW-2 upgradient wells sampled annually
- MW-3, MW-4, MW-5, MW-6 sampled semiannually

#### Analytical Parameters (laboratory methods unchanged from 2006)

- VOC list (same as 2006)
- Electrical Conductance (lab and field)
- pH (lab and field)
- tubidity (field)
- temperature (field)
- Ammonia (as N)
- Alkalinity, Total (as CaCO3)
- Chloride
- Nitrate (as N)
- Sulfate
- Total Dissolved Solids (TDS)
- Barium, Total
- Calcium, Total
- Magnesium, Total
- Potassium, Total
- Sodium, Total

Detailed sampling methodology will be provided, if required, at a later date.

#### **ATTACHMENT E**

**FIGURES** 

SITE LOCATION MAP
AERIAL PHOTOGRAPH

GAS WELL, MONITORING WELL, AND SURFACE WATER SAMPLE LOCATION MAP

